

**Slider for zip fastener with two tabs and a single fork
for releasing the slider**

DESCRIPTION

5 The present invention relates to the field of what are
called "zip fasteners", in other words fasteners which
can be opened and closed by pulling on either one of
two tabs connected on opposite sides, by means of their
rings, to a slider, in other words to the member which
10 joins and disengages the teeth of the fastener.

An example of such a slider is described in the patent
EP 204 184 B1 held by YKK, and another example is
illustrated in Swiss patent application 01697/03 filed
15 by the present applicant.

In both of the said examples, the slider is locked in
its position by means of a pointed member which
penetrates between the teeth of the fastener, and in
20 order to move the slider it is first necessary to
disengage this member, which can also be called a
"pawl", from the teeth.

To ensure that this locking operation can be performed
25 by pulling as stated on either one of the two tabs
connected to the slider, the terminal rings of the tabs
are connected to two levers, located inside the hollow
body of the slider on opposite sides of the plane of
the fastener, and interconnected by contact or by means
30 of suitable return members. One of these levers is
connected integrally to the aforesaid pawl, and the
levers are designed and positioned in such a way that a
pull on either one of the two tabs will directly or
indirectly cause the movement of the said pawl in such
35 a way as to disengage it from the teeth of the
fastener.

The manufacture of the levers described above and of
the corresponding actuating systems entails production

and assembly costs which, given the intrinsically relatively low value of a slider with two tabs, have a significant effect on the final cost.

5 Moreover, since an increase in the number of parts of an assembly also increases the potential causes of malfunction, the reliability of sliders made as described above can sometimes be inadequate, and in order to achieve correct operation it is necessary to
10 use more costly methods and materials, which in turn have an additional effect on the price.

The inventor of the slider with two tabs according to the present invention has devised a solution in which
15 the aforementioned two levers form a single piece, and more specifically a single fork whose two prongs perform the function of the said two levers. This fork, connected by means of the aforesaid prongs to one of the sliders and to the pawl described previously, is
20 pivoted within the hollow body of the slider, and is shaped and positioned in such a way that, by pulling as stated on either one of the two tabs, the user can act on the pawl in such a way that it is disengaged from the teeth of the fastener so that the slider can be
25 moved.

Like all sliders with two tabs, the slider according to the invention, as described below, comprises elastic means for keeping the pawl inserted between the teeth
30 of a fastener until, when the said prongs are acted on, these means are deformed elastically to a sufficient degree to disengage the pawl.

The object of the present invention is therefore a
35 slider for fasteners with two tabs as described in the attached Claim 1.

Two examples of embodiment of the slider according to the invention will now be described, with additional

reference to the attached drawings, in which:

- Figure 1 is an enlarged longitudinal section through a first example of embodiment of the slider according to the invention, in which the pawl does not form part of the said fork, and is provided with an elastically flexible portion which keeps it inserted between the teeth of a fastener;
- Figure 2 is the same longitudinal section as that shown in Fig. 1, in which the fork has been made to rotate by a pull on the tab in the upper part of the drawing, in such a way that the aforesaid pawl is disengaged from the teeth of the fastener;
- Figure 3 is the same section as that shown in the preceding figures, in which the pawl is disengaged from the teeth of the fastener by a pull on the tab in the lower part of the drawing;
- Figure 4 is the enlarged longitudinal section through a second example of embodiment, in which the pawl is formed integrally on the terminal part of one of the prongs of the fork, and the elastic means for returning the pawl to the position in which it locks the slider consist of a spring interposed between the fork and the hollow body of the slider;
- Figure 5 is the same longitudinal section as that shown in Fig. 4, in which the prong bearing the pawl has been made to rotate, thus disengaging the pawl, by means of the tab in the upper part of the drawing;
- Figure 6 is the section shown in Figure 5, in which the prong bearing the pawl has been made to rotate by a pull on the other prong of the fork by means of the tab in the lower part of the drawing.

With reference initially to Figures 1, 2, 3, these show how, in a slider 1 with two tabs 2 and 3 according to the invention, its hollow body 4 houses within it a fork 10, pivoted at a point P of the slider and

consisting of two prongs 5 and 6 positioned on opposite sides of the plane β occupied by the teeth Z_i of a fastener (not all of which is shown). A flexibly elastic strip 8 terminates in a pawl 7, and the strip 8 is shaped in such a way that, when no force is applied to it, its pawl 7 is kept inserted between the said teeth Z_i to keep the slider 1 locked. The said strip 8 is positioned so that it faces and is parallel to one prong 5 of the fork 10.

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The tab 2 in the upper part of the drawing is connected by its ring 2a to the said strip 8 in such a way that pulling the tab (see Fig. 2) causes the pawl 7 to be disengaged from the teeth Z_i (arrow M).

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The tab 3 in the lower part of the drawing is connected by its ring 3a to the prong 6 in the lower part of the drawing, and pulling this tab causes a rotation (arrow R in Fig. 3) of the fork 10 about the said point P, in a plane α perpendicular to the plane β of the teeth Z_i , which makes the prong 5 in the upper part of the drawing, which is in contact with the strip 8, cause an elastic deformation of the strip in this case also, thus disengaging the pawl 7 from the teeth Z_i (arrow N).

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It should be noted that, whereas the tab 2 in the upper part of the drawing acts directly by traction on the strip 8, the tab 3 in the lower part of the drawing acts on the said prong 6 by pressing with its ring 3a on a surface with inclined planes S in such a way as to cause the said rotation R of the fork 10.

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This system of connection by means of inclined planes is known to those skilled in the art.

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Figure 4 shows another example of embodiment 11 of the slider according to the invention. In this case also, the slider 11 has a hollow body 14 in which is housed a

fork 20 with two prongs 15 and 16, pivoted at a point Q in such a way that it can rotate (arrow O, Figures 5 and 6) in a plane α perpendicular to the plane β of the teeth Zi of the fastener (again not all of which is shown).

In this case, however, the said pawl 7 does not form part of a separate member, but is formed integrally on the free end 15t of a prong 15, which is drawn in the upper part of the figure.

As shown in Figures 5 and 6, pulling on either one of the two tabs 2 and 3 connected by their rings 2a and 3a to the two prongs 15 and 16 makes the fork 20 rotate in the direction of the said arrow O, thus extracting (arrow V) the aforesaid pawl 17 from the teeth Zi of the fastener.

In this case, the elastic force which keeps the pawl 17 inserted between the said teeth Zi is provided by a spring 9 interposed between the fork 20 and the hollow body 4 of the slider 11, the spring being positioned and designed in such a way as to oppose the said rotation O of the fork 20.

In both embodiments described above, a slider 1, 11 according to the invention is provided, this slider consisting of a smaller number of components and being consequently more reliable and less expensive to produce.